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THE DEMAND AND SUPPLY CONCEPTS: AN INTRODUCTION TO THE STUDY OF MARKET PRICE

II

Hitherto we have been engaged in the task of sifting from the rather heterogeneous mass of current thought, in regard to demand and supply, characteristics which admit of being arranged in a consistent series. We have now the far more difficult task of discussing the effect upon these phenomena of a most significant modern economic development—the transition from money to credit economy.

The current conceptions of demand and supply which have been dominant in economic thought take little or no account of this development. They rest on a naïve assumption of impossible market simplicity. They assume a market in which buyers and sellers are engaged exclusively in the exchange of consumption goods for their own immediate uses, in which, in other words, there are no exchanges of intermediate goods, or relatively permanent productive agents, no credit sales, and no bargains for future delivery. In short, they assume a market in which the time element is lacking. It is our purpose now to rise above this naïve conception of the market and to consider, sixthly, the effect upon the general character of demand and supply of the fact that bargains for purchase and sale are concluded with reference not only to the quantity and price of commodities, but also to the time of delivery and payment. In doing this we shall have by no means fully discussed the demand and supply effects of the time

element. We shall have considered time merely in its relation to the general concepts 'demand" and "supply." Realizing the strangeness of the country through which we are to travel and the danger of going astray without the aid of familiar guide-posts, our attitude in this discussion will be that of an explorer who maps out the region as he sees it, but, realizing the limited range of his vision, waits eagerly the accounts of other travelers.[1]

If we are to understand the demand and supply potency of the bargain-time element, we must determine the effect of variations in the time of payment and delivery upon the willingness and ability of prospective dealers to offer and to take goods in the market. This involves first a discussion of the relation between valuation and the lapse of time.

Intelligent observation of empirical data seems to show that the postponement of the possession of a good detracts from the present worth of its acquisition. For example, the present worth of a dinner to a hungry man just drawing up to it is greater than the present worth of the command by the same man over the same dinner postponed till the next day. A tired worker just starting on his annual vacation places a higher estimate on its worth to him than he does upon the power to command the vacation of the following year. The economic explanation usually offered for this generalization is in the main this: that deferred gratifications[2] are lessened in prospect. But whatever the psychological or psycho-physical basis of this fact may be, for the economist the proof of its generality must finally rest on simple experience. It is always open, therefore, to challenge from this standpoint; but, clearly defined, it appears to stand the empirical test. In order to show this we shall have to inspect it somewhat more closely.

[1] The writer wishes to acknowedge his indebtedness to Professor Frank A. Fetter for directing his attention to the pervasiveness of the time element in modern economy, for fundamental notions in regard to the relationship between valuation and the lapse of time. He is also indebted, for important suggestions which have been worked out in the discussion, to Professor Herbert Joseph Davenport.

[2] "Gratification," whenever it is used in this thesis, must not be interpreted as identical with pleasure or happiness in the crude hedonistic sense. It is here used to mean simply that complex of considerations which, together with its negative, determines choice.

It is not claimed, then, by those who intelligently adhere to this generalization, that the gratifications derived from an object postponed are actually lessened, or, to put the matter more objectively, that the worth to us of postponed goods is necessarily actually lessened. The enhancement to us of the worth of goods that we have previously stored up is among the commonest economic experiences. Evidently, then, the proposition must not be taken to mean more than that the postponement of the use of a good makes it of less worth to the individual *at the time of the postponement* than it would be if immediately used to gratify his needs. That is to say, the estimates compared, if this proposition is to be valid, must be of present as against future worth made by the individual at a single moment of time.

But will the proposition thus interpreted hold? Evidently it will not. The very fact that rational men do postpone the consumption or use of goods in their possession or under their control negatives the proposition as thus stated. The hungry man possessed of a dollar does not contemplate eating two fifty-cent dinners today, and partly at least because he realizes that a greater sum of gratifications is to be had, or that to a greater extent his purposes are to be subserved, by distributing the dinners over both today and tomorrow. So also the tired worker who can command at will a month of vacation within two years very likely chooses to postpone half of it because of his belief that he will thus get the maximum of gratification or better subserve his purposes. The hungry man knows that he will be hungry again tomorrow, and if he believes that his hunger then will be keener than today at the end of the first dinner, he may fix the future at a higher point than he will the present worth of it. The worker will be influenced by similar considerations, and in addition his action may be influenced by differences in the vacation possibilities of this and next year. If circumstances are such that this year he will be forced to spend his vacation in the city, while next year he believes that he will be able to take it at the seaside or in the mountains, where he feels perhaps that he may derive greater benefit, it is very probable that even at the present time the future vacation may seem the more desirable of the two, and he may

even decide to forego any relaxation this year in order to spend the two weeks at present under his control in a more desirable manner in the future. Evidently, then, we must still further restrict the main proposition by stipulating that the comparison must not only be of the present as against the future worth of the good made at the time of postponement, but also that the individual making the comparison must assume that the relation of his need to the good will be essentially identical at the two points of time, and that the good itself will have essentially the same want-gratifying power in the future as at the present. Only if all these allowances are made can we say with certainty that the good postponed will appear to be of less worth than the good present.

It may appear now to the reader that we have emasculated our proposition. This, however, is not true. We have merely guarded it against misstatement. The proposition was not that a postponed good is lessened in value, but that the *postponement* of the possession or use of a good detracts from the present worth of its acquisition to the individual concerned. That is, that postponement *per se* detracts from estimated worth of acquisition. The actual present worth of the postponed good to the individual is an algebraic sum in which a discount for time always figures as a negative term. The actual result may be an amount which is more or less than the worth of the good for present uses, according to the specific variation in the other elements which we have considered. Postponement itself, however, is always an element lessening the present worth of acquisition of the postponed good; and it seems clear, moreover, that this lessening of worth is in direct ratio[3] to the extent of postponement, so that ultimately, if the postponement is long enough, the actual present worth of the postponed good, regardless of the accessory circumstances, must be diminished, falling in the extreme case to zero.

Our first assumption, then, in regard to the effect of postponement upon valuation appears to be sound when tested by the facts of everyday life. However, it is to be observed that we

[3] This statement is not intended to be taken as indicating that the lessening of worth is in exact ratio to the increasing of the time of postponement. It is merely intended to indicate that as the time of postponement increases the lessening of worth increases.

have thus far considered only one of two equally important specific aspects of the question. Market bargaining involves not only prospective acquisition, but also prospective relinquishment of goods. Bidders contemplate not only the gratifications to be acquired in the acquisition of goods with their uses, but also the gratifications to be sacrificed in the relinquishment of goods with their uses. The willingness and ability of A to take corn, for example, means his willingness and ability to offer money or some other good. Just as, then, we have considered the effect of postponement of possession or acquisition upon estimates of worth, so we must consider the effect of postponement—of relinquishment—i. e., of non-possession; for the bargain-time element concerns the time both of delivery and of payment.

At bottom the latter problem seems to be the reciprocal of the one just considered. Relinquishment is the reciprocal of acquisition, sacrifice of gratification, the postponement of delivery the reciprocal of the postponement of payment for the same good. Accordingly, we should expect to find the effect upon worth of postponed relinquishment to be the reciprocal of the effect of postponement of possession. And this, in fact, seems to be the case. That is to say, the postponement of the payment for a good detracts from the present negative worth of relinquishment. Or, to put the matter in positive terms, the postponement of payment detracts from the present estimate of the worth to be relinquished. The psychological explanation of this fact is usually considered to be that postponed sacrifices are lessened in prospect. But, whatever its psychological basis, the main proposition seems amply proved by introspection and observation.

However, this proposition must, like that concerning the effect of postponed acquisition, be strictly construed. It does not mean necessarily that the sacrifices undergone in the relinquishment of an object are necessarily lessened by postponement of the relinquishment, nor that the present estimate of the worth to be relinquished is always lessened by postponement of relinquishment. It means simply that, when the individual making the comparison assumes that the relation of his need to the good is to be the same in the future as at present, and that the good itself is to

be essentially the same, postponement of relinquishment will then lessen the estimate of the present worth to be relinquished. In other words, postponement of relinquishment *per se* detracts from the estimated present worth to be relinquished, or sacrificed. This being admitted, observation and introspection seem to show also that the lessening of the sacrifice of relinquishment as estimated in the present is, other things being equal, in direct ratio[4] to the length of time that relinquishment is postponed.

The relation between valuation and the lapse of time seems then in its main aspects to be clear and simple. Postponement lessens the present importance both of deferred gratifications and of deferred sacrifices. Clear as may be the reasoning upon which this conclusion is founded, however, it must not be accepted if it can be shown to do violence to any of the undoubted facts of the market. Before attempting, then, to use it in generalization, in connection with the characterstics of demand and supply, it will be well to consider quite carefully possible contradictions to its validity in actual market experience.

It seems reasonably clear, then, that if all the bidders in the market were men for whom the good bid upon and the good used in making payment had a direct personal and present use in consumption, postponement would always discount the present worth of gratifications and sacrifices, and that the conclusion which we have drawn would, of necessity, be universal in its application. But is it true that all the bidders in the market have a direct and immediate use in consumption for their goods? Evidently it is not. Barring money from consideration, in order to free the subject from unnecessary complication, by assuming that it is a good which may always be considered as desired for personal and immediate use, there are two cases at least where the interest in the goods taken by prospective purchasers and sellers is not of this nature. There are cases, first, where the bidder has personal use for the good in question, but the usefulness of it to him lies exclusively either in the present or in the future. A contractor, for example, who is to construct a building the coming season, has no use in consumption for materials at present, but he is likely

[4] See p. 404, n. 3.

to be in the market now bidding for the goods to be delivered in the future at the time of his need. Secondly, there are cases where the sole interest of the bidder in the good in question is speculative in its nature; that is to say, where the bidder expects simply to pass the good acquired along at a profit, having no consumptive use for it, either present or future. The situation is so familiar that it needs no illustration. Both cases apparently involve exceptions to the bargain-time discount rules which we have formulated. The question for us then, is: Are these exceptions real or merely apparent? Let us examine each case separately.

Considering buyer and seller, and both good in question and means of payment, there are eight possible variations of the first case. They are, however, merely permutations of which the example already cited is typical. We shall be warranted, therefore, in confining our attention to this example. Can we say, then, truthfully that where the prospective purchaser—e. g., the contractor—has little or no present use for the commodity in question, the postponement of its delivery to a time when he has a positive or relatively great use for it detracts from its present worth? Such a statement is, on the face of it, obviously absurd. But does this concession invalidate the principle of time discount? Reference to what has already been said justifies a negative answer. As we have seen, only where the relation between the good and the needs of the individual concerned are assumed to be identical does the postponement of delivery necessarily result in a positive detraction from the present worth of the good. In so far, then, as the contractor may have present need for the commodity identical with his future need, we are still justified in assuming that postponement of delivery *per se* lessens the present worth of acquisition, and will affect negatively the amount of the good which he will be willing and able to take at a certain hypothetical price per unit.

But does this argument really dispose of the present case? Here we have a typical market situation, where on assumption there is no possible identity between present and future needs dependent on the good, because the prospective purchaser has *no*

present use for the good Although, then, the principle of time discount remains valid where it applies, does not this case indicate that there are market situations which include the element of postponement where the principle of discount is not involved; in other words, have we not shown that the principle of time discount, while operative in certain market cases, is not of universal market application? Apparently this is true; but it will not do to give an offhand answer to a question of such great importance. We must examine it with all due care.

Really we have here two distinct questions: (1) Is the time element as a factor determining demand or supply at all involved in a case of this kind; and (2) if so, does postponement here operate as a discount factor? Let us consider these questions in detail.

First, then, in the case supposed above, where it is assumed that the prospective purchaser has no present use for the good, is the time element at all involved—does postponement in any way affect the present worth of the good? The argument against any such effect seems offhand, simple, and cogent: If there is no present use for the good, there is no present need for it; how then can its immediate possession have any present worth, and how then can any comparison be instituted between the worth of present and future delivery? But if no temporal comparison can be instituted, it surely cannot be said that time enters as a factor into the problem.

This line of argument might perhaps be successfully combated by the subtle assumption that no case really can exist where goods are purchased for future delivery in the absence of a present need. And it seems not unreasonable to say, in support of this view, that where the individual, as in this case, has no present use in consumption for the good in question, the insurance of the satisfaction of his future need for it creates of necessity a very positive present need—the need of present control through purchase. Holders of this view would assert that the actual presence in the market, at the moment, of prospective purchasers for future delivery would be inexplicable on any other assumption.

But the possibility and actuality of temporal present-worth

comparisons where goods are sought to be purchased for future delivery can be shown by a slightly different, and perhaps less subtle, line of reasoning. The essential purpose of the prospective purchaser in such a case is to secure a coincidence with the needs of a certain time in the future of the means for their gratification. This coincidence has a present worth to him, the simple proof of which is the insertion in such bargains of a forfeit to be paid in case of non-delivery at the time specified. The existence of this present worth being granted, it follows that it varies with the possibility of contract failure. Possibility of delay of means beyond the point of time when the needs are anticipated obviously would lessen the present worth of their future possession, and it is easily conceivable that the same effect might result from premature delivery of the goods in question. There seems no doubt, then, that the time element does operate as a factor determining demand and supply in the class of cases typified by the purchase for future delivery in the absence of present consumptive needs.

This brings us to the second question in connection with such cases: Does postponement invariably operate as a discount factor. The example just cited seems to require a negative answer, and thus to nullify the universality at least of the general assumption that postponement always detracts from the present estimate of gratifications to be acquired or sacrificed, and affects therefore in an invariable manner demand and supply. Are we driven at last, then, to abandon or modify this principle? No. Sound reason reveals it still triumphant. Where the need which prompts to purchase is wholly assigned to the future and therefore conditions are such as to cause a bargain for a future delivery, we may still say with truth that the present worth of the gratifications to the purchaser which the good represents is less than it would have been had the want in question been felt in the present instead of in the future, and had the conditions therefore existed which would have caused a bargain for present delivery.

In this case it is the need itself that has undergone discount, for time and discount of the need obviously involve, in this case, discount of the gratifications associated with the object which stands in causal relation to the satisfaction of that need. In this

case, therefore, we may still say with truth that the amount of the good which the prospective purchaser is willing and able to take at a specified price is less than it would have been if conditions had been such that the bargain might have called for present delivery. In short, there is nothing in this type of cases which invalidates our general principle that postponement detracts from the present estimate of gratification and sacrifice.

Before, however, we can accept this principle and the conclusions to be drawn from it without reserve, we must examine the second apparent source of exception to its validity. There are cases, then, in the market where the sole interest of the bidder in the good in question is speculative in its nature; that is to say, where the bidder expects and desires simply to pass the good on again at a profit. Apart from retail dealing, this seems to be almost the typical market attitude. Under such circumstances can it be said that future delivery detracts from the present worth of the good? To get a concrete instance to work upon, take the case of a dealer in wheat on the produce exchange, who, having no interest in wheat except as a trader, determines in March to buy for May delivery. Can we say that the postponement of delivery in this case acts as a discount on the worth of the acquisition to the prospective purchaser? At first blush an affirmative answer seems absurd, but let us analyze the situation carefully.

The need which the prospective purchaser has for wheat is represented by his desire to turn over his capital at a profit. The strength of this need is in proportion to the percentage of profit that can be made on the operation. The motive of the prospective purchaser in desiring to contract for future delivery is based on his belief that the selling price at that time will exceed the purchase price to a greater extent than it does at the present moment. But, as his need is measured by his profit, this is to say that his need for wheat in May is estimated by him to be greater than his need for it at the present moment. And it is this difference in the relation between his wants and the good at the two different points of time that causes him to prefer the future delivery. If the principle at stake has been clearly comprehended, this analysis of the situation shows at once that the present case forms no

exception of its operation. If the estimated money profit to be obtained by delivery in May were no greater than the profit resulting from delivery in March, it is obvious that March delivery would be preferred. But this is merely saying that, in so far as the estimated needs dependent on the good in question are identical at the two periods of time, the postponement of delivery detracts from the present worth of the good.

In the absence of contradictory evidence, then, we seem justified in accepting, provisionally at least, and properly interpreted, the principles that the postponement of the possession of a good detracts from the present worth of its acquisition, and that the postponement of the non-possession or giving-up of a good detracts from the present estimate of the sacrifice involved in its relinquishment. In the absence of contradictory evidence, also, we seem justified in assuming that these principles underlie and affect the estimates of market bidders in all cases connected with the prospective purchase or sale of goods where postponement of delivery or payment, or both, are contemplated. If this much be granted, the following conclusions in regard to the general relation between the time element on the one hand, and individual demand and supply motives on the other, must also be provisionally accepted: (*a*) In the case of the prospective purchaser, first, postponement of delivery must tend to lessen the willingness to take a good from the market, because it lessens the present worth of the good to be acquired, and we can safely assume that a man's willingness to purchase goods, other things being equal, will depend on his estimate of their present worth to him; secondly, postponement of payment must tend to increase the willingness and ability to take a good from the market because it lessens the present worth to be sacrificed, and a man's willingness and ability to purchase, other things being equal, obviously depend on the extent of the sacrifice made at the time of the bargain. (*b*) In the case of the prospective seller, first, postponement of delivery must tend to increase the willingness to bring forward a good in the market, because it lessens the present worth to be sacrificed; secondly, postponement of payment must tend to lessen the willingness and ability to bring forward a good in the market, because

it lessens the present worth of the payment to be received. (*c*) It follows that at any given hypothetical price series, other things remaining the same, first, postponement of delivery must tend to decrease the demand of individual bidders in the market for any given good, and to increase the supply of the good which individual bidders will bring forward to the market; secondly, postponement of payment must tend to increase the demand of individual bidders in the market for any good, and to decrease the supply of the good which individual bidders will bring forward to the market. (*d*) Finally, on our original assumption that total market demand and supply of any good represent the summation of the demand and supply of individuals, we reach the conclusion from the above that, first, all other things remaining the same, postponement of delivery must tend to decrease the total market demand, and to increase the total market supply of any given good; secondly, postponement of payment must tend to increase the total market demand, and to decrease the total market supply of any given good.[5]

Thus we finally and definitely seem to have established as a sixth general characteristic that the demand and supply of a commodity are to be expressed as correlations of the three factors—quantity, price, and time. It remains in this connection to exhibit concretely the general character of these phenomena as resultants of this threefold correlation.

We have seen that, abstracting from the time element, demand and supply may each be expressed as a single schedule of correlated quantities and hypothetical prices; the demand schedule representing the varying amounts of the good in question, which prospective purchasers are willing and able, or are imputed to be willing and able, to take at all possible hypothetical prices; the supply schedule, the varying amounts which prospective sellers are willing and able, or are imputed to be willing and able to bring forward at corresponding hypothetical prices. If we accept these schedules as adequate concrete expressions of demand and supply, when the time element is disre-

[5] In all this the reader is begged to bear in mind that the term "market" is used in the abstract generic, and not in the specific, sense.

garded, it becomes obvious that they are also perfectly valid expressions of demand and supply when the time element is taken into consideration, provided that this element is assumed to be invariable. That is to say, if in the market, bargains invariably specified exactly the same conditions in regard both to delivery and to payment, the calculations of prospective purchasers and sellers would always be made on the assumption of an invariable temporal agreement, and the single schedules which we have used would still be adequate expressions of demand and supply considered as correlations of the three elements. Let us then assume, as we may without error, that these schedules adequately represent demand and supply in the case of the simplest bargain type—where, that is to say, the market agreement calls for cash down and immediate delivery. Our present task will then be to show how this schedule must, if at all, be modified, or what, if any, additional schedules must be constructed in order to give a complete expression of demand and supply under all possible temporal bargain conditions.

In general, there seem to be three solutions of this problem which are worthy of consideration Each of these is based on a distinct notion in regard to the essential nature of time as a market factor. In the first solution time is assumed to be an independent good bought and sold in the market; in the second, time, in its double market aspect, is regarded as an essential element, on the one hand of price, and on the other of the good in question; in the third solution both these assumptions are denied, and time is looked upon, as hitherto in this thesis, as a distinct market-bargain factor co-ordinate with price and quantity of good. We shall consider these solutions in order.

According, then, to the first view expressed above, a given concrete market bargain, where the time element is present, is not the resultant of a simple co-ordination or correlation of the three elements—quantity, price, and time. It is rather the final resultant or compound of two independent correlations—a cor relation of price and quantity, and another correlation of price and time. In other words, every concrete market bargain represents logically the resultant of two acts of purchase and sale. That

is to say, first, the good in question is itself purchased or sold for a given price regardless of any temporal consideration, and, secondly, the privilege of postponing delivery or payment, or both, is bargained for at a certain price. The price finally actually paid, then, is to be looked upon as the sum paid for two goods—for a certain quantity of commodity and for a certain temporal privilege.

To make the matter perfectly clear, take a concrete case. A sells a ton of coal to B to be delivered at once and paid for one month from date. This matter, which appears superficially as a single bargain, really involves two independent transactions, according to the view under examination: first, the purchase by B of a ton of coal at a certain price, and, secondly, the purchase by B at another price of the privilege of postponing payment for one month. Or, looking at the matter from the opposite standpoint, we may say that A sells, first, a ton of coal at a certain price and, secondly, the privilege of postponement of payment at a certain price. The illustrations might, of course, be greatly varied according to the temporal bargain conditions assumed and the particular standpoint taken, but this will be sufficient perhaps to indicate the essential significance of the double-bargain proposition.

In this view, then, there is in the market at any time a single prevailing price for any given commodity, and time is simply one of the commodities bought and sold, having therefore its own single prevailing rate or price. It follows that, in all bargains for commodity x where postponement of payment or delivery is agreed upon, while the superficial observer, assuming that the commodity alone is purchased and sold, sees evidence of a variation in the price of the commodity x, the enlightened observer knows that the real price paid for x is the same regardless of the temporal agreements, and sees in the apparent variation of price a purchase of time—the price paid for time acting as an equalizer in all concrete sales. The view here expressed, it is pointed out, receives confirmation in the everyday language of the market when we speak of selling a good at a certain price, so much off for cash, or so much additional for credit.

This analysis and illustration of the concrete nature of a market sale indicate clearly how, according to the first solution named above, the time element finds concrete expression in demand and supply. Whenever in the concrete case the prospective purchaser or seller of a commodity (not time) contemplates the possibility of purchasing or selling for future delivery or payment, he enters the market with at least two distinct schedules in mind—one representing demand or supply, as the case may be, of the commodity (not time), the other representing demand or supply of time.

For example, A, let us suppose, is a prospective purchaser of some commodity, x. If he is altogether unwilling to accept postponed delivery and is committed irrevocably to cash payment, the time element will not enter into his considerations, and his demand for x may be adequately represented by the single schedule given on page 423. In so far as all prospective purchasers in the market are in the same mood as A, this schedule may be made adequately to represent the general demand for x in a given market. If A, however, desires credit, or will consent to postponement of delivery, he will naturally enter the market with more or less well-defined notions of what he is willing and able to do in case credit may be obtained or immediate delivery is to be foregone. That is to say, he will take into consideration the time element. In such cases, according to the double-bargain theory, it is evident that, in addition to the schedule of the amounts of the good x that he is willing and able to take at all varying hypothetical prices, he will have in mind also a time-price schedule. This additional schedule will represent time discounts. It will consist, in case he contemplates postponement of delivery, of the varying lengths of time of postponement which he is willing and able to allow at various hypothetical discount rates or time prices. If he contemplates postponement of payment, his time schedule will consist of the varying amounts which he is willing to pay for varying degrees of credit extension. But these time schedules, according to this view, represent in the first case supply and in the second case demand for a quite distinct commodity. They exist and are specifically determined quite independently of

the commodity x, whose price under all temporal conditions is invariable, and whose demand is still the simple, original schedule given. Similar illustrations might be given for supply, which is held to be in all essential respects analogous to demand.

To sum up, then, according to the view just considered: The real price paid for any commodity (not time) is always its cash-immediate delivery price; the real demand and supply of any commodity (except time) are the varying amounts of it which prospective purchasers and sellers are willing and able, or are imputed to be willing and able respectively, to take and bring forward at all possible hypothetical prices; time is an independent commodity or good; the price of time is the prevailing discount rate; the demand and supply of time are respectively the varying amounts of credit extension for which bidders are, or are imputed to be, willing and able to pay varying hypothetical prices, and the varying amounts of postponement of delivery which bidders are, or are imputed to be, willing and able, to allow at varying hypothetical prices; any ordinary concrete bargain in which time enters as postponement of delivery or of payment, or of both, involves two distinct price payments and two distinct demand and supply calculations; that is to say, in such a market-bargain the three elements—quantity, price, and time—are finally correlated through the summation of the results of two simple correlations of two terms each.

This view of the nature and effect of the market time element apparently makes the objective demand-and-supply problem a very simple one. We must now inquire whether there are any serious objections to its acceptance.

In the first place, is there not an element of unreality in this subtle analysis of the market situation? Does not this view place a strained interpretation upon the actual attitude of men who enter the market contemplating credit and future delivery bargains? These are questions, of course, on which the mere observer can secure only inferential evidence. The positive data are entirely subjective, and no man can, apart from elaborate inductive study, give positive answers except for himself. There is room here, therefore, for honest difference of opinion.

It is the opinion of the writer that the typical bidder who enters the market to purchase or sell a given commodity is not consciously contemplating bidding for two distinct goods. He is certainly conscious of the existence and significance to him of the time element in connection with the commodity which he intends to buy or sell; but does he not always think of the time element as most intimately associated with the good—as a quality which modifies for him the usefulness of the commodity in question? That is to say, does not the time element appear to him always as somewhat in the nature of a coefficient of some other good, and while, as in the loan market the coefficient appears to outrank the importance of the good itself, are not these two things always thought of as standing to each other, not in arithmetic, but in algebraic relation? It appears to the writer that this is the case, and that this attitude is but the natural reflection of the essential nature of the objective situation. The fact is that, if it should prove to be true that time is an economic good, it would certainly not be a substantive, but always an adjective good. That is to say, time is never an independent market commodity and has significance in the market only as attached to some substantive commodity or commodities. Mere time, in other words, is not bought and sold. It has no demand-and-supply schedule, and no price apart from some other good. If this be true, however, we seem forced to abandon the double-market-bargain theory in favor of one or the other of the alternative views earlier suggested.[6]

The argument against the double-bargain theory leads up to the second hypothetical solution, mentioned on page 408, which is based on the assumption that time in its market relationship is an essential element, on the one hand of price, and on the other of the good which prospective purchasers and sellers are contemplating. According to this view, whenever a good is bought and sold in the market, and the time element is present, this element does

[6] The really decisive consideration against what we have called the double-market-bargain theory of demand and supply lies outside the possible scope of this paper. It will appear in the sequel, however, that when the time element enters into the bargain for a commodity, the true basis upon which is reckoned the utility of the commodity *per se* as supply is essentially different from what it is when the bargain contemplates immediate cash payment and immediate delivery. To the initiated this fact is conclusive evidence.

not appear either as a distinct good which is separately bargained for, or as a distinct and independent bargain element, but is assimilated, in the case of postponement of delivery, with the good, and in case of a postponement of payment, with the price. In other words, every variation in the market-bargain time element in connection with the purchase and sale of a given physical or objective commodity creates a new good or a new price. In short, from this standpoint a single kind of physical commodity in the market, uniform in quality—as for example, No. 1 May wheat—really consists of as many different and distinct kinds of economic goods as there are variations in the time of delivery contemplated by prospective or actual purchasers and sellers; and, on the other hand, a given amount of money which is to be paid for a unit of the physical commodity, say a bushel of wheat, really constitutes as many different prices as there are different degrees of postponement of payment contemplated by prospective or actual purchasers and sellers. Whenever, therefore, a variation occurs in the market time element—for example, when the time element is introduced as credit—it does not mean that an amount of a good is offered or taken at the same price as before, but that a new price for this article exists. Also, when the time element enters as a postponement of delivery, we have a new good, and thus evidently a new and distinct price problem.

To make this matter perfectly clear, take again a specific example. A wishes to buy a ton of coal from X, for which he is willing to pay $5 cash for immediate delivery; B also wishes to buy this ton of coal, and is willing to pay $5 cash for delivery three months later; C also wishes the coal, but demands immediate delivery, and is willing to pay $5 one month from date of sale and delivery. Now, according to the view which we are contemplating, under these circumstances this ton of coal is not one but two distinct economic goods. If A or C succeed in trading, they get a different good from that obtained by B if he secures the coal. On the other hand, if A or B trade, they pay a price for the coal which is different from that which C pays if he succeeds in making a bargain for it.

If this view be accepted, the problem of the effect of the time

element on demand and supply—the final correlation of the three market elements—is solved by merging the third element (time) with either or both of the other two; in short, by denying its independent existence. The number of distinct goods and of possible prices in the market is enormously increased, but the demand and supply of each good is adequately represented by the simple quantity-price demand and supply schedules and curves which we have already constructed. The only changes which we should be obliged to make in our demand and supply illustrations would be that, on the one hand, instead of constructing a single demand and a single supply schedule or curve for commodity x, we should be obliged to construct separate schedules and curves for commodity x delivered immediately, for commodity x delivered three months from date, or at any other time; and, on the other hand, instead of allowing $5 to represent one price in the construction of each of these schedules and curves, we should be obliged to allow $5 to represent a descending series of prices, beginning with $5 cash and running down to the greatest possible hypothetical credit extension in the market. In concluding this exposition, it should be noted that, though, according to this view, the demand and supply of a single economic good are adequately represented by schedules and curves as simple as these which appear on page 423, still the demand and supply of any given physical commodity in the market where the time element appeared in the form of variable degrees of postponement of delivery could be completely expressed only by a series of irreducible schedules and curves analogous to those just mentioned.

What, now, is to be said as to the validity of this disposal of the time element as a demand-and-supply factor? As in the case of the double-market-bargain theory, it does not seem wise here to dogmatize. Here also there seem to be reasonable grounds for honest difference of opinion. However, again it appears to the writer that the best solution of the problem has not been found. If we were at liberty to construct a new economic terminology, there might perhaps be no fundamental objection to defining price as a definite amount of a price-good paid at a

definite time. In the terminology which we have, however, price seems to have no such general connotation, but is understood to be a definite quantity of a given commodity simply. On the other hand, it must be admitted that we have the beginnings of such a terminology in such expressions as "price, $5 net." Still, as things stand, price seems to be an objective thing. It is an amount of a commodity paid; it is a dollar, a bushel, a day's service, a sonata. It has its varying subjective worth, like all other objective things. But it would seem to be straining the point to say that it is a different price when this worth varies. If this view were taken, a good which sold invariably for $5 cash would have as many different prices, for aught anyone could tell, as there might be different individual purchasers of it. If variation in the time element is, however, assumed to alter price, it is simply because of the variation in the subjective worth of the given amount of objective commodity paid at the different times. But if we cannot say that $5 is a different price when paid by A than when paid by B, because of difference in subjective worth, how can we say that it is a different price when paid by A at two different periods, because it represents at the different periods different subjective worths to him? If we are to avoid unnecessary readjustments of terminology, it would seem necessary to reject the idea that the market time element as represented by postponement of payment may be assimilated with price.

Turning to the other side of the question, the objections to the view under discussion seem to be at least as potent. According to this view, it will be remembered, every variation in the time of delivery of a given physical commodity makes of it a new economic good. If we view this matter from the standpoint of two individuals, the proposition at once appears untenable. Surely x, other things remaining the same, is one and the same good though A, desiring it, demands immediate delivery, while B is willing to accept it a month from the date of the bargain. The exigencies of theory do not seem to warrant us in wrenching ourselves loose from the common-sense point of view with such violence as the denial of this proposition would require. Moreover, if we look at the question from the standpoint of a single individual, the

outcome seems equally unfavorable to this view-point. The reason for asserting that a change in the time of delivery creates a new economic good is evidently that the objective or physical commodity plus postponement does not mean the same to an individual measured in gratifications as does the good without postponement of possession. But this is merely saying that the psychic income derived from the commodity, under the different temporal conditions, varies. However, variation in the psychic income from a good seems hardly sufficient ground for denial of its identity.

In short, it seems altogether reasonable to say that an economic good as it appears in the market is an objective thing. It may stand in different relations to my wants, and possess different degrees of utility for me at different times, but it is still the same good. Its time relation to me is analagous to its quantity relation. The good is not changed in character when its quantity is increased; why, then, is it changed in character when a time relation is changed which involves no greater alteration in its utility to me than the change in quantity? On the whole, then, it seems best to reject the second solution offered in explanation of the demand-and-supply potency of the market-time element.

Having no other present alternative, then, we are obliged to fall back upon provisional acceptance of the third solution mentioned earlier. According to this view, time, as it functions in the market, is neither an independent good nor an essential element of price or good. On the contrary, it is an integral and independently varying element of the market-bargain. From this standpoint a good has for the individual who contemplates purchasing or selling it varying degrees of utility, according to varying degrees of postponement of payment or delivery. Consequently, at any given hypothetical price the quantities of the good which the individual will be willing and able to bring forward as supply or to demand will vary with each variation in the time element, other things being equal. If this be true, the demand or supply of a commodity at any given hypothetical price will be represented by varying amounts as the time element varies. We are brought, in short, to look upon our cash-immediate delivery

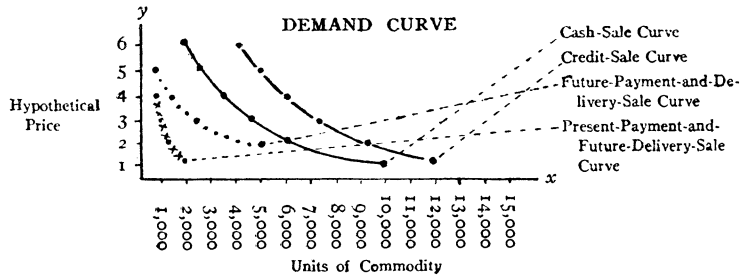
schedules illustrated on page 423 as expressing one of a great variety of possible correlations of quantity price and time in connection with the demand and supply of a commodity, all of which together constitute the general demand and supply of the commodity in question at any given place and time. In short, we seem driven to the conclusion that the demand and supply of any commodity at any place and time must be represented by a series of schedules, each of which represents the amount of the commodity in question which prospective purchasers and sellers respectively are, or are imputed to be, willing and able to take and to offer at all possible hypothetical prices, in consideration of a specified time or times of delivery and payment.

In order to make this statement perfectly clear, and to furnish an unequivocal basis for the determination of the question whether or not we have really reached a true and final expression of market demand and supply, we must have concrete illustration. It is understood, of course, that, according to the view stated above, every possible essential variation in the bargain-time element results in a distinct demand or supply schedule variation. In order to make possible any practicable concrete illustration, then, we must make a selection of temporal market-bargain variations. Let us then select on the basis of bargain types.

A little consideration shows that there are at least four possible distinct types of bargains in the market resulting from variations in the time element. There is, first, the simple cash bargain —a purchase and sale on the terms of immediate payment and immediate delivery; secondly, the simple deal in futures—a purchase and sale for future delivery and future payment; thirdly, the credit sale, which calls for immediate delivery and future payment; and, fourthly, conceivably, a bargain which calls for immediate payment and future delivery. With the exception of the first, each of these types, as indicated above, is capable of infinite specific variation through variation in the extent of the time allowed for payment or delivery; but we may assume, for illustrative purposes, that each type is invariable. We obtain thus in the case of commodity x the following concrete illustration of our last conclusion in regard to the nature of demand and supply as correlations of the factors—quantity, price, and time:

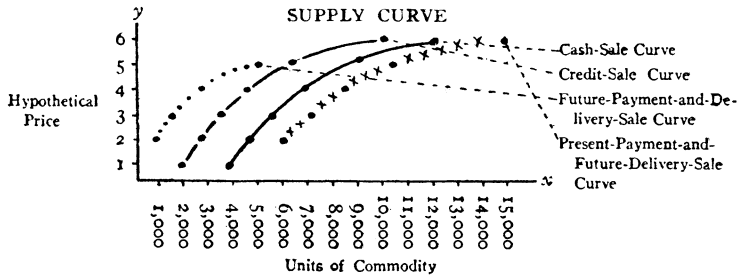
DEMAND SCHEDULE

HYPOTHETICAL PRICE	UNITS OF COMMODITY HYPOTHETICALLY TO BE TAKEN			
	Cash Sale	Future Payment and Delivery	Credit Sale	Present Payment and Future Delivery
1y	10,000x	.....	12,000x	2,000x
2y	7,000x	5,000x	9,000x	1,000x
3y	5,000x	2,000x	7,000x	500x
4y	3,500x	1,000x	5,500x	250x
5y	2,500x	600x	4,500x	.....
6y	2,000x	.....	4,000x	.....



SUPPLY SCHEDULE[7]

HYPOTHETICAL PRICE	UNITS OF COMMODITY HYPOTHETICALLY TO BE DISPOSED OF			
	Cash Sale	Future Payment and Delivery	Credit Sale	Present Payment and Future Delivery
1y	4,000x	.....	2,000x	.....
2y	4,500x	600x	2,500x	6,000x
3y	5,500x	1,000x	3,500x	7,000x
4y	7,000x	2,000x	5,000x	9,000x
5y	9,000x	5,000x	7,000x	12,000x
6y	12,000x	.....	10,000x	15,000x



[7] It is understood, of course, that these schedules, represent only arbitrary portions of the actual demand and supply of a commodity. A complete representation would show the quantities taken and offered at all possible hypothetical prices and for all possible times of payment. It is also to be understood that the relation here taken between the amounts demanded or supplied and the corresponding basis is arbitrary.

By a process of exclusion we seem at last to have reached, then, a final conclusion in regard to the demand-and-supply potency of the bargain-time element. This conclusion must, however, be taken merely as provisional. The thoughtful reader will immediately be assailed with doubts as to the validity of the results attained. One of these sources of doubt may be easily eliminated, but others can be adequately discussed only in the sequel.

The query which may be at once disposed of is this: Is it not possible to unite in the one case the various schedules here assumed to represent demand, and in the other those assumed to represent supply, so that in each case we may have a single comprehensive and unified expression? Certainly the mind naturally strains toward this conclusion, and at first blush this seems to be a valid assumption. Careful examination, however, seems to show that such union is impossible. We may say, indeed, that altogether these schedules represent total demand and supply for the commodity supposed to be in question. But when we attempt to go farther and affect their actual summation, we find at once that we are attempting to add discrete things. It is like trying to add four apples and five pears. To show this clearly, let us take the simplest illustration.

Suppose that at the hypothetical price, five cents, the demand for x could be represented thus:

Ten units where cash is to be paid and delivery is to be immediate.

Twelve units where three months' credit is to be allowed and delivery is to be immediate.

Eight units where cash is to be paid and three months is to be allowed for delivery.

Eleven units where three months' credit is to be allowed and delivery is to be three months postponed.

A mere glance at this concrete example shows that here we have three distinct elements to consider, and it is manifestly impossible to represent their combined results in a two-element schedule, unless we can find a method of reducing the third element to terms of one of the others. If the preceding argument has been followed, the impossibility of this reduction will not be doubted. These schedules, then, must be regarded as independent and irreducible. In this view no single and unified expression of total demand and supply is possible.

It should now be obvious that the result which we have reached is altogether incompatible with the naïve assumptions which have been current in economic discussion in regard to the nature of demand and supply, and the simplicity of the manner in which they determine the price of any commodity. In consequence, we should assign these assumptions to the limbo of once useful, but now outworn, machinery of discussion. But conceding this does not necessarily stamp with approval the machinery which we have installed. Indeed, if the demand and supply of a commodity are to be represented at any time and place by the irreducible schedules which we have constructed, and if it is still to be postulated that demand and supply determine price, the question how this result is accomplished presents a most complicated aspect, which at once involves us in a serious dilemma and casts the gravest doubt on the finality of our conclusion as an expression of *specific* market demand and supply. Do these irreducible schedules altogether determine the market price of the commodity? If so, are all those representing respectively demand and supply of equal or of varying importance? How shall we determine the part played by each—their relative importance? But how, after all, is it possible to conceive of the process by which these distinct and irreducible schedules unite to determine a single market price? On the other hand, if we abandon the notion that demand and supply as a whole determine market price, must we not assume that each pair of schedules determines a price? If so, which of the various possible prices is *the* market price we are seeking? That is to say, which are *the* demand and supply of which economists have been so fond of discoursing?

Evidently, on the basis of our present conclusions, if we are to retain the demand-and-supply formula, we are driven to choose between two alternatives: (1) either we must reject the single-market-price theory and say that a given commodity may have a great number of prices in the same market at the same time; or (2) we must abandon what might be called the single-market theory and say that there are as many distinct markets for a commodity at a given time and within a so-called competitive area

as there are distinct types of bargain based on differences in time of payment and of delivery. If we accept the second alternative, we abandon the notion that demand and supply as a whole at any time and within any so-called competitive area determine the price of a commodity, in favor of a specific demand-and-supply formula, assuming practically that each pair of irreducible demand-and-supply schedules represents the demand and supply of the commodity in a different specific market.

Intelligent choice between these alternatives can evidently be made only after a careful consideration of the nature of a market. We find ourselves, then, committed in the further prosecution of our problem, precedent to the discussion of the market process, to a study of the nature of markets, and the *specific* character of market demand and supply. In this study we shall be obliged, among other things, to determine (1) to what extent, if at all, there may be various independent markets for the same commodity within a so-called market area, (2) whether or not the essential nature of a market varies with the character of a good, and (3) whether it is possible to find single universal expressions respectively for specific demand and supply in all markets and for all kinds of goods.

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